# CORROSION SCIENCE

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# CORROSION SCIENCE

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R.-D. GRIMM and D. LANDOLT 1847 Salt films formed during mass transport controlled dissolution of iron–chromium alloys in concentrated chloride media
HE YEDONG and F. H. STOTT 1869 The selective oxidation of Ni–15%Cr and Ni–10%Cr alloys promoted by surface-applied thin oxide films
Y. NIU, F. GESMUNDO and F. VIANI 1885 The oxidation–sulfidation of Fe–Nb alloys at 600–800°C in $H_2$–$H_2S$–$CO_2$ mixtures
G. BECH-NIELSEN, M. KJÆR LARSEN, K. A. JENSEN and D. ULRICH 1907 The corrosion and dissolution valence of a chromated Zn–Fe alloy studied by CMT and EC measurements
M. JANIK-CZACHOR, A. WOŁOWIK and Z. WERNER 1921 The stability of the passive state on Al–Mo sputter-deposited glassy metals
A. D. MODESTOV, G.-D. ZHOU, Y.-P. WU, T. NOTOYA and D. P. SCHWEINSBERG 1931 A study of the electrochemical formation of Cu(I)–BTA films on copper electrodes and the mechanism of copper corrosion inhibition in aqueous chloride/benzotriazole solutions
P. NEUFELD 1947 Effect of magnetic fields on electrochemical reactions

*Book Reviews*
J. SCULLY 1949 Corrosion Handbook for Stainless Steels
T. R. GRIFFITHS 1950 Concise Encyclopedia of Chemistry
1951 Corrosion Diary

**NUMBER 12**

T. C. ZHANG, X. X. JIANG, S. Z. LI and X. C. LU 1953 A quantitative estimation of the synergy between corrosion and abrasion
C. A. GERVASI, A. R. DI SARLI, E. CAVALCANTI, O. FERRAZ, E. C. BUCHARSKY, S. G. REAL and J. R. VILCHE 1963 The corrosion protection of steel in sea water using zinc-rich alkyd paints. An assessment of the pigment-content effect by EIS
Y. NIU, F. GESMUNDO, F. VIANI and F. RIZZO 1973 The corrosion of Co–Nb alloys in reducing/oxidizing–sulfidizing gases at 600–800°C
X. G. ZHENG and D. J. YOUNG 1999 High temperature corrosion of pure chromium in CO–$CO_2$–$SO_2$–$N_2$ atmospheres
J. Y. LIU and C. C. SU 2017 Environmental effects in the stress corrosion cracking of turbine disc steels
S. H. CHEN, R. T. YEH, T. P. CHENG and I. J. YANG 2029 Hydrogen sulphide stress corrosion cracking of TIG and laser welded 304 stainless steel
G. ROCCHINI 2043 Magnetite stability in aqueous solutions as a function of temperature

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